INDEX TO AUTHORS

A

AUBERT, JEAN-PAUL, and BRONNER, FELIX. A symbolic model for the regulation by bone metabolism of the blood calcium level in rats, 349

AUGENSTEIN, LEROY. See YEARGERS and AUGENSTEIN, 687

B

BENTON, RICHARD. See MILHORN, BENTON, ROSS, and GUYTON, 27

BRONNER, FELIX. See AUBERT and BRONNER, 349

BROWN, A. C., and KASTELLA, K. G. The AC impedance of frog skin and its relation to active transport, 591

BROWNELL, G. L. See MYHILL, WADSWORTH, and BROWNELL, 89

BRUNER, L. J. The electrical conductance of semipermeable membranes. I. A formal analysis, 867

——. II. Unipolar flow, symmetric electrolytes, 887

C

CARSTENSEN, E. L., COX, H. A., JR., MERCER, W. B., and NATALE, L. A. Passive electrical properties of microorganisms. I. Conductivity of *Escherichia coli* and *Micrococcus lysodeikticus*, 289

CASSIM, JOSEPH Y., and TAYLOR, EDWIN W. Intrinsic birefringence of poly-γ-benzyl-L-glutamate, a helical polypeptide, and the theory of birefringence, 531

—— and ——. The effects of solvent environment on the optical rotatory dispersion parameters of polypeptides. I. Studies on poly-γ-benzyl-L-glutamate, 553

—— and ——. II. Studies on poly-L-glutamic acid, 573

COHEN, H., and COOLEY, J. W. The numerical solution of the time-dependent Nernst-Planck equations, 145

CONTI, FRANCO, and EISENMAN, GEORGE. The non-steady-state membrane potential of ion exchangers with fixed sites, 247

—— and ——. The steady-state properties of ion exchange membranes with fixed sites, 511

COOLEY, J. W. See COHEN and COOLEY, 145

COSTER, H. G. L. A quantitative analysis of the voltage-current relationships of fixed charge membranes and the associated property of punch-through, 669

COX, H. A., JR. See CARSTENSEN, COX, MERCER, and NATALE, 289

CUCINELL, SAMUEL A. See PERL and CUCINELL, 211, 616

D

DAVIES, MARTIN. Thermal migration in biological transport?, 651

DEERING, R. A. See GRAY, KILKSON, and DEERING, 473

E

EISENMAN, GEORGE. See CONTI and EISENMAN, 247, 511

ETZOLD, HELMUT. See JAFFE and ETZOLD, 715

F

FAVEJEE, J. CH. L., VAN DER PLAS, L., SCHOORL, R., and FLOOR, P. X-Ray diffraction of the crystalline structure of the avian egg shell: Some critical remarks, 359

FLOOR, P. See FAVEJEE, VAN DER PLAS, SCHOORL, and FLOOR, 359

FORRO, FREDERICK, JR. Autoradiographic studies of bacterial chromosome replication in amino acid–deficient *Escherichia coli* 15T⁻, 629

G

GOLDMAN, D. E. Errata: A molecular structural basis for the excitation properties of axons, 615

GONSER, U., and GRANT, R. W., Mössbauer effect in hemoglobin and some iron-containing biological compounds, 823

GORESKY, C. A. See SILVERMAN and GORESKY, 487

GRANT, R. W. See GONSER and GRANT, 823

GRAY, D., KILKSON, REIN, and DEERING, R. A. Inactivation of oriented bacteria with polarized ultraviolet light, 473

GREGG, E. C., and STEIDLEY, K. DAVID. Electrical counting and sizing of mammalian cells in suspension, 393

GUYTON, ARTHUR C. See MILHORN, BENTON, ROSS, and GUYTON, 27

GUZZO, ANTHONY V. The influence of amino acid sequence on protein structure, 809

H

HAYASHI, MARIE N., HAYASHI, M., and SPIEGELMAN, S. Chromatographic separation of annealed and enzymatically synthesized RNA-DNA hybrids, 231

HAYASHI, M. See HAYASHI, HAYASHI, and SPIEGELMAN, 231

HORGAN, J. D., and LANGE, R. L. Digital computer simulation of respiratory response to cerebrospinal fluid P_{CO_2} in the cat, 935

HOUSE, C. R. Rectification of water flow across frog skin, 987

J

JACOBS, E. E. See MALING, WEISSBLUTH, and JACOBS, 767

JAFFE, LIONEL. On the concentration gradient across a spherical source washed by slow flow, 201

—— and ETZOLD, HELMUT. Tropic responses of *Funaria* spores to red light, 715

——. See MÜLLER and JAFFE, 317

JAGGER, JOHN, and STAFFORD, R. S. Evidence for two mechanisms of photoreactivation in *Escherichia coli* B, 75

K

KASTELLA, K. G. See BROWN and KASTELLA, 591

KIANG, N. Y.-S. See PFEIFFER and KIANG, 301

KILKSON, REIN. See GRAY, KILKSON, and DEERING, 473

——. See MAESTRE and KILKSON, 275

KIRKALDY, J. S. Thermodynamics of terrestrial evolution, 965

——. Thermodynamics of the human brain, 981

KOGA, SHOZO. See SUGIURA and KOGA, 439

L

LANGE, R. L. See HORGAN and LANGE, 935

LEHMAN, ROBERT C., and POLLARD, ERNEST. Diffusion rates in disrupted bacterial cells, 109

LIBOFF, RICHARD L. A biomagnetic hypothesis, 845

LING, GILBERT N., and OCHSENFELD, MARGARET M. Studies on the ionic permeability of muscle cells and their models, 777

M

MACINTYRE, WALTER M., SINGH, PHIRTU, and WERKEMA, MARILYN S. The crystal and molecular structure of 8-azaguanine monohydrate, 697

MAESTRE, MARCOS F., and KILKSON, REIN. Intrinsic birefringence of multiple-coiled DNA, theory and applications, 275

MALING, J. E., WEISSBLUTH, M., and JACOBS, E. E. Enzyme substrate reactions in high magnetic fields, 767

MERCER, W. B. See CARSTENSEN, COX, MERCER, and NATALE, 289

MILHORN, HOWARD T., JR., BENTON, RICHARD, ROSS, RICHARD, and GUYTON, ARTHUR C. A mathematical model of the human respiratory control system, 27

MILLER, D. M. The kinetics of selective biological transport. I. Determination of transport constants for sugar movements in human erythrocytes, 407

——. II. Equations for induced uphill transport of sugars in human erythrocytes, 417

MISRAHY, GEORGE A. See SILVER, STRAUSS, and MISRAHY, 855

MORTON, R. A. See SINCLAIR and MORTON, 1

MÜLLER, DIETER, and JAFFE, LIONEL. A quantitative study of cellular rheotropism, 317

MURTY, N. R., and RABINOWITCH, E. Fluorescence decay studies of chlorophyll *a in vivo*, 655

MYHILL, J., WADSWORTH, G. P., and BROWNELL, G. L. Investigation of an operator method in the analysis of biological tracer data, 89

N

NATALE, L. A. See CARSTENSEN, COX, MERCER, and NATALE, 289

NOONEY, GROVE C. Iron kinetics and erythron development, 755

NORTON, DORITA A. Preparation of steroid structural data for the consideration of possible structural-functional relationships, 425

O

OCHSENFELD, MARGARET M., See LING and OCHSENFELD, 777

OFFNER, FRANKLIN. Limitations on complexity of random learning networks, 195

O'KONSKI, CHESTER T., and STELLWAGEN, NANCY C. Structural transition produced by electric fields in aqueous sodium deoxyribonucleate, 607

P

PERL, WILLIAM, and CUCINELL, SAMUEL A. Correction of Local blood flow in human leg muscle measured by a transient response thermoelectric method, 616

—— and ——. Local blood flow in human leg muscle measured by a transient response thermoelectric method, 211

PFEIFFER, R. R., and KIANG, N. Y.-S. Spike discharge patterns of spontaneous and con-

tinuously stimulated activity in the cochlear nucleus of anesthetized cats, 301
VAN DER PLAS, L. See FAVEJEE, VAN DER PLAS, SCHOORL, and FLOOR, 359
PLONSEY, ROBERT. An extension of the solid angle potential formulation for an active cell, 663
POLLARD, ERNEST. See LEHMAN and POLLARD, 109

R

RABINOWITCH, E. See MURTY and RABINOWITCH, 655
RAMACHANDRAN, G. N. See RAMAKRISHNAN and RAMACHANDRAN, 909
RAMAKRISHNAN, C., and RAMACHANDRAN, G. N. Stereochemical criteria for polypeptide and protein chain conformations. II. Allowed conformations for a pair of peptide units, 909
RAUTH, ANDREW M. The physical state of viral nucleic acid and the sensitivity of viruses to ultraviolet light, 257
RIKMENSPOEL, ROBERT. The tail movement of bull spermatozoa. Observations and model calculations, 365
ROSS, RICHARD. See MILHORN, BENTON, ROSS, and GUYTON, 27

S

SAUER, KENNETH. Molecular orientation in quantasomes. III. A flow dichroism apparatus and its application to the study of the structure of spinach quantasomes, 337
SCHEIDER, WALTER. Dielectric relaxation of molecules with fluctuating dipole moment, 617
SCHOORL, R. See FAVEJEE, VAN DER PLAS, SCHOORL, and FLOOR, 359
SCHUMAKER, VERNE N., and WAGNILD, JUDITH. Zone centrifugation in a cesium chloride density gradient caused by temperature change, 947
SILVER, GORDON A., STRAUSS, JOSÉ, and MISRAHY, GEORGE A. Electrical impedance of isolated amnion, 855
SILVERMAN, M., and GORESKY, C. A. A unified kinetic hypothesis of carrier-mediated transport: Its applications, 487
SINCLAIR, W. K., and MORTON, R. A. X-Ray and ultraviolet sensitivity of synchronized Chinese hamster cells at various stages of the cell cycle, 1
SINGH, PHIRTU. See MACINTYRE, SINGH, and WERKEMA, 697
SMITH, D. R., and SMITH, G. K. A statistical analysis of the continual activity of single cortical neurons in the cat unanesthetized isolated forebrain, 47
SMITH, G. K. See SMITH and SMITH, 47
SPIEGELMAN, S. See HAYASHI, HAYASHI, and SPIEGELMAN, 231
STAFFORD, R. S. See JAGGER and STAFFORD, 75
STEIDLEY, K. DAVID. See GREGG and STEIDLEY, 393
STEIN, RICHARD B. A theoretical analysis of neuronal variability, 173
STELLWAGEN, NANCY C. See O'KONSKI and STELLWAGEN, 607
STRAUSS, JOSÉ. See SILVER, STRAUSS, and MISRAHY, 855
SUGIURA, YOSHIHIKO, and KOGA, SHOZO. Dielectric behavior of yeast cells treated with $HgCl_2$ and cetyl trimethyl ammonium bromide, 439

T

TAYLOR, EDWIN W. See CASSIM and TAYLOR, 531, 553, 573
TILLE, J. A new interpretation of the dynamic changes of the potassium conductance in the squid giant axon, 163
TRUCCO, ERNESTO. A note on Puck and Steffen's equations for the life cycle analysis of mammalian cells, 743

W

WADSWORTH, G. P. See MYHILL, WADSWORTH, and BROWNELL, 89
WAGNILD, JUDITH. See SCHUMAKER and WAGNILD, 947
WEISSBLUTH, M. See MALING, WEISSBLUTH, and JACOBS, 767
WERKEMA, MARILYN S. See MACINTYRE, SINGH, and WERKEMA, 697
WILSON, D. M., and WYMAN, ROBERT. Motor output patterns during random and rhythmic stimulation of locust thoracic ganglia, 121
WYMAN, ROBERT. See WILSON and WYMAN, 121
——. Probabilistic characterization of simultaneous nerve impulse sequences controlling dipteran flight, 447

Y

YEARGERS, EDWARD, and AUGENSTEIN, LEROY. UV spectral properties of phenylalanine powder, 687

INDEX TO SUBJECTS

A

Acid-deficient, amino, *Escherichia coli* 15T⁻ autoradiographic studies of bacterial chromosome replication in, 629
——, amino, sequence, influence of, on protein structure, 809
——, deoxyribonucleic, multiple-coiled, intrinsic birefringence of, theory and applications, 275
——, deoxyribonucleic, and RNA hybrids, annealed and enzymatically synthesized, chromatographic separation of, 231
——, poly-L-glutamic, studies on, effects of solvent environment on optical rotatory dispersion parameters of polypeptides, 573
——, ribonucleic, and DNA hybrids, annealed and enzymatically synthesized, chromatographic separation of, 231
——, viral nucleic, physical state of, and sensitivity of viruses to ultraviolet light, 257
Amino acid–deficient *Escherichia coli* 15T⁻, autoradiographic studies of bacterial chromosome replication in, 629
—— acid sequence, influence on protein structure, 809
Ammonium bromide, cetyl trimethyl, and $HgCl_2$, dielectric behavior of yeast cells treated with, 439
Amnion, isolated, electrical impedance of, 855
Anesthetized cats, spike discharge patterns of spontaneous and continuously stimulated activity in cochlear nucleus of, 301
——, unanesthetized isolated forebrain, statistical analysis of continual activity of single cortical neurons in cat, 47
Angle, solid, potential formulation, for active cell, extension of, 663
Annealed and enzymatically synthesized RNA-DNA hybrids, chromatographic separation of, 231
Apparatus, flow dichroism, application to study of structure of spinach quantasomes, 337
Autoradiographic studies of bacterial chromosome replication in amino acid–deficient *Escherichia coli* 15T⁻, 629
Avian egg shell, x-ray diffraction of crystalline structure of, 359
Axon, squid giant, new interpretation of dynamic changes of potassium conductance in, 163
Axons, molecular structural basis for excitation properties of, 615
Azaguanine, 8-, monohydrate, crystal and molecular structure of, 697

B

Bacteria, oriented, with polarized ultraviolet light, inactivation of, 473
Bacterial cells, disrupted, diffusion rates in, 109
—— chromosome replication in amino acid–deficient *Escherichia coli* 15T⁻, autoradiographic studies of, 629
Biological compounds, some iron-containing, and hemoglobin, Mössbauer effect in, 823
—— tracer data, investigation of operator method in analysis of, 89
—— transport, selective, kinetics of, determination of transport constants for sugar movements in human erythrocytes, 407
—— transport, selective, kinetics of, equations for induced uphill transport of sugars in human erythrocytes, 417
—— transport, thermal migration in, 651
Biomagnetic hypothesis, 845
Birefringence, intrinsic, of multiple-coiled DNA, theory and applications, 275
——, intrinsic, of poly-γ-benzyl-L-glutamate, birefringence theory, 531
Blood calcium level in rats, symbolic model for regulation by bone metabolism, 349
—— flow, local, in human leg muscle measured by transient response thermoelectric method, 211, 616
Bone metabolism of blood calcium level in rats, symbolic model for regulation by, 349
Brain, human, thermodynamics, 981
Bromide, cetyl trimethyl ammonium, and $HgCl_2$, dielectric behavior of yeast cells treated with, 439

C

Calcium, blood, level in rats, symbolic model for regulation by bone metabolism of, 349
Carbon dioxide pressure in cat, digital computer simulation of respiratory response to cerebrospinal fluid, 935
Carrier-mediated transport, unified kinetic hypothesis of, applications, 487
Cell, active, extension of solid angle potential formulation for, 663
—— cycle, x-ray and ultraviolet sensitivity of

synchronized Chinese hamster cells at various stages of, 1
Cells, disrupted bacterial, diffusion rates in, 109
——, mammalian, in suspension, electrical counting and sizing of, 393
——, mammalian, Puck and Steffen's equations for life cycle analysis of, 743
——, muscle, and models, ionic permeability of, 777
——, synchronized Chinese hamster, at various stages of cell cycle, x-ray and ultraviolet sensitivity of, 1
——, yeast, dielectric behavior of, treated with $HgCl_2$ and cetyl trimethyl ammonium bromide, 439
Cellular rheotropism, quantitative study of, 317
Centrifugation, zone, in cesium chloride density gradient caused by temperature change, 947
Cerebrospinal fluid, P_{CO_2} in cat, digital computer simulation of respiratory response to, 935
Cesium chloride density gradient, caused by temperature change, zone centrifugation in, 947
Cetyl trimethyl ammonium bromide and $HgCl_2$, dielectric behavior of yeast cells treated with, 439
Chain conformations, polypeptide and protein, stereochemical criteria for, allowed conformations for pair of peptide units, 909
Charge, fixed, membranes and associated property of punch-through, quantitative analysis of voltage-current relationships of, 669
Chloride, cesium, density gradient caused by temperature change, zone centrifugation in, 947
Chlorophyll *a in vivo*, fluorescence decay studies of, 655
Chromatographic separation of annealed and enzymatically synthesized RNA-DNA hybrids, 231
Chromosome, bacterial, replication in amino acid–deficient *Escherichia coli* 15T⁻, autoradiographic studies of, 629
Cochlear nucleus of anesthetized cats, spike discharge patterns of spontaneous and continuously stimulated activity in, 301
Complexity of random learning networks, limitations on, 195
Computer, digital, simulation of respiratory response to cerebrospinal fluid P_{CO_2} in the cat, 935
Concentration gradient across spherical source washed by slow flow, 201
Conductance, electrical, of semipermeable membranes, formal analysis, 867
Conductance, electrical, of semipermeable membranes, unipolar flow, symmetric electrolytes, 887
——, potassium, in squid giant axon, new interpretation of dynamic changes of, 163
Conductivity of *Escherichia coli* and *Micrococcus lysodeikticus*, passive electrical properties of, 289
Conformations, polypeptide and protein chain, stereochemical criteria for, allowed conformations for pair of peptide units, 909
Control system, mathematical model of human respiratory, 27
Cortical neurons, single, in cat unanesthetized isolated forebrain, statistical analysis of, 47
Crystal and molecular structure of 8-azaguanine monohydrate, 697
Crystalline structure of avian egg shell, x-ray diffraction of, 359
Current, alternating, impedance of frog skin and relation to active transport, 591
Current-voltage relationships of fixed charge membranes and associated property of punch-through, quantitative analysis of, 669
Cycle, life, analysis of mammalian cells, Puck and Steffen's equations for, 743

D

Decay, fluorescence, studies of chlorophyll *a in vivo*, 655
Density gradient, cesium chloride, caused by temperature change, zone centrifugation in, 947
Deoxyribonucleate, aqueous sodium, structural transition produced by electric fields in, 607
Deoxyribonucleic acid, multiple-coiled, intrinsic birefringence of, theory and applications, 275
—— acid and RNA hybrids, annealed and enzymatically synthesized, chromatographic separation of, 231
Dichroism, flow, apparatus, application to study of structure of spinach quantasomes, 337
Dielectric behavior of yeast cells treated with $HgCl_2$ and cetyl trimethyl ammonium bromide, 439
—— relaxation of molecules with fluctuating dipole moment, 617
Diffraction, x-ray, of crystalline structure of avian egg shell, 359
Diffusion rates in disrupted bacterial cells, 109
Digital computer simulation of respiratory response to cerebrospinal fluid P_{CO_2} in the cat, 935
Dipole moment, fluctuating, dielectric relaxation of molecules with, 617
Dipteran flight, probabilistic characterization of simultaneous nerve impulse sequences controlling, 447

Discharge patterns, spike, of spontaneous and continuously stimulated activity in cochlear nucleus of anesthetized cats, 301
Dispersion parameters, optical rotatory, of polypeptides, effects of solvent environment on, studies on poly-γ-benzyl-L-glutamate, 553
—— parameters, optical rotatory, of polypeptides, effects of solvent environment on, studies on poly-L-glutamic acid, 573
Dynamic changes of potassium conductance in squid giant axon, new interpretation, 163

E

Egg shell, avian, x-ray diffraction of crystalline structure of, 359
Electric fields, structural transition produced by, in aqueous sodium deoxyribonucleate, 607
Electrical conductance of semipermeable membranes, formal analysis, 867
—— conductance of semipermeable membranes, unipolar flow, symmetric electrolytes, 887
—— counting and sizing of mammalian cells in suspension, 393
—— impedance of isolated amnion, 855
—— properties, passive, of microorganisms, conductivity of *Escherichia coli* and *Micrococcus lysodeikticus*, 289
Electrolytes, symmetric, unipolar flow, electrical conductances of semipermeable membranes, 887
Enzymatically synthesized and annealed RNA-DNA hybrids, chromatographic separation, 231
Enzyme substrate reactions in high magnetic fields, 767
Equations, Nernst-Planck time-dependent, numerical solution of, 145
——, Puck and Steffen's, for life cycle analysis of mammalian cells, 743
Erythrocytes, human, determination of transport constants for sugar movements in, kinetics of selective biological transport, 407
——, human, equations for induced uphill transport of sugars in, kinetics of selective biological transport, 417
Erythron development and iron kinetics, 755
Escherichia coli B, evidence for two mechanisms of photoreactivation in, 75
—— *coli* and *Micrococcus lysodeikticus*, conductivity of, passive electrical properties of, 289
—— *coli* 15T⁻, amino acid–deficient, autoradiographic studies of bacterial chromosome replication in, 629
Evolution, terrestrial, thermodynamics, 965
Exchange membranes, ion, with fixed sites, steady-state properties of, 511
Exchangers, ion, with fixed sites, non-steady-state membrane potential of, 247
Excitation properties of axons, molecular structural basis for, 615

F

Fields, electric, structural transition produced by, in aqueous sodium deoxyribonucleate, 607
——, high magnetic, enzyme substrate reactions in, 767
Flight, dipteran, probabilistic characterization of simultaneous nerve impulse sequences controlling, 447
Flow dichroism apparatus, application to study of structure of spinach quantasomes, 337
——, local blood, in human leg muscle measured by transient response thermoelectric method, 211, 616
——, slow, concentration gradient across spheriod source washed by, 201
——, unipolar, symmetric electrolytes, electrical conductance of semipermeable membranes, 887
——, water, across frog skin, 987
Fluid, cerebrospinal P_{CO_2} in cat, digital computer simulation of respiratory response to, 935
Fluorescence decay studies of chlorophyll *a in vivo*, 655
Forebrain, cat unanesthetized isolated, statistical analysis of continual activity of single cortical neurons in, 47
Frog skin, AC impedance of, and relation to active transport, 591
—— skin, water flow across, 987
Funaria spores, tropic responses to red light, 715

G

Ganglia, locust thoracic, motor output patterns during random and rhythmic stimulation of, 121
Gradient, cesium chloride density, zone centrifugation in, caused by temperature change, 947
——, concentration, across spherical source washed by slow flow, 201

H

Helical polypeptide, poly-γ-benzyl-L-glutamate, intrinsic birefringence, birefringence theory, 531
Hemoglobin and some iron-containing biological compounds, Mössbauer effect in, 823

Hybrids, RNA-DNA, annealed and enzymatically synthesized, chromatographic separation of, 231

I

Impedance, AC, of frog skin and relation to active transport, 591
——, electrical, of isolated amnion, 855
Impulse sequences, simultaneous nerve, controlling dipteran flight, probabilistic characterization of, 447
Intrinsic birefringence of multiple-coiled DNA, theory and applications, 275
Ion exchange membranes with fixed sites, steady-state properties of, 511
—— exchangers with fixed sites, non-steady–state membrane potential of, 247
Ionic permeability of muscle cells and models, 777
Iron kinetics and erythron development, 755
Iron-containing biological compounds and hemoglobin, Mössbauer effect in, 823

K

Kinetic hypothesis, unified, of carrier-mediated transport, applications, 487
Kinetics, iron, and erythron development, 755
—— of selective biological transport, determination of transport constants for sugar movements in human erythrocytes, 407
—— of selective biological transport, equations for induced uphill transport of sugars in human erythrocytes, 417

L

Learning networks, random, limitations on complexity of, 195
Leg muscle, human, local blood flow in, measured by transient response thermoelectric method, 211, 616
Letters to the Editor, 359, 615, 616, 987
Life cycle analysis of mammalian cells, Puck and Steffen's equations for, 743
Light, polarized ultraviolet, inactivation of oriented bacteria with, 473
——, red, tropic responses of *Funaria* spores to, 715
——, ultraviolet, sensitivity of viruses to, and physical state of viral nucleic acid, 257

M

Magnetic fields, high, enzyme substrate reactions in, 767
Magnetism, biomagnetic hypothesis, 845
Mammalian cells in suspension, electrical counting and sizing of, 393
—— cells, Puck and Steffen's equations for life cycle analysis of, 743
Man, brain, thermodynamics, 981
——, erythrocytes, determination of transport constants for sugar movements in, kinetics of selective biological transport, 407
——, erythrocytes, equations for induced uphill transport of sugars in, kinetics of selective biological transport, 417
——, leg muscle, local blood flow in, measured by transient response thermoelectric method, 211, 616
——, respiratory control system, mathematical model of, 27
Mathematical model of human respiratory control system, 27
Mechanisms of photoreactivation in *Escherichia coli* B, evidence for two, 75
Membrane potential, non-steady–state, of ion exchangers with fixed sites, 247
Membranes, fixed charge, and associated property of punch-through, quantitative analysis of voltage-current relationships of, 669
——, ion exchange, with fixed sites, steady-state properties of, 511
——, semipermeable, electrical conductance of, formal analysis, 867
——, semipermeable, electrical conductance of, unipolar flow, symmetric electrolytes, 887
Mercury chloride and cetyl trimethyl ammonium bromide, dielectric behavior of yeast cells treated with, 439
Metabolism, bone, of blood calcium level in rats, symbolic model for regulation by, 349
Micrococcus lysodeikticus and *Escherichia coli*, conductivity of, passive electrical properties of, 289
Microorganisms, passive electrical properties of, conductivity of *Escherichia coli* and *Micrococcus lysodeikticus*, 289
Model calculations and observations, tail movement of bull spermatozoa, 365
——, mathematical, of human respiratory control system, 27
Mössbauer effect in hemoglobin and some iron-containing biological compounds, 823
——, symbolic, for regulation by bone metabolism of blood calcium level in rats, 349
Molecular and crystal structure of 8-azaguanine monohydrate, 697
—— orientation in spinach quantasomes, flow dichroism apparatus and application to study of structure, 337
—— structural basis for excitation properties of axons, 615
Molecules with fluctuating dipole moment, dielectric relaxation of, 617
Monohydrate, 8-azaguanine, crystal and molecular structure of, 697
Movement, tail, of bull spermatozoa, observations and model calculations, 365
Muscle cells and models, ionic permeability of, 777

Muscle cells and models, human leg, local blood flow in, measured by transient response thermoelectric method, 211, 616

N

Nernst-Planck equations, time-dependent, numerical solution of, 145
Nerve impulse sequences, simultaneous, probabilistic characterization of, controlling dipteran flight, 447
Networks, random learning, limitations on complexity of, 195
Neuronal variability, theoretical analysis, 173
Neurons, single cortical, in cat unanesthetized isolated forebrain, statistical analysis of, 47
Nucleic acid, deoxyribo-, multiple-coiled, intrinsic birefringence of, theory and applications, 275
—— acid, deoxyribo-, and RNA hybrids, annealed and enzymatically synthesized, chromatographic separation of, 231
—— acid, ribo-, and DNA hybrids, annealed and enzymatically synthesized, chromatographic separation of, 231
—— acid, viral, physical state of, and sensitivity of viruses to ultraviolet light, 257
Nucleus, cochlear, of anesthetized cats, spike discharge patterns of spontaneous and continuously stimulated activity in, 301

O

Optical rotatory dispersion parameters of polypeptides, effects of solvent environment on, studies on poly-γ-benzyl-L-glutamate, 553
—— rotatory dispersion parameters of polypeptides, effects of solvent environment on, studies on poly-L-glutamic acid, 573
Orientation, molecular, in spinach quantasomes, flow dichroism apparatus and application to study of structure, 337

P

Parameters, optical rotatory dispersion, of polypeptides, effects of solvent environment on, studies on poly-γ-benzyl-L-glutamate, 553
——, optical rotatory dispersion, of polypeptides, effects of solvent environment on, studies on poly-L-glutamic acid, 573
Peptide units, conformations for pair of, stereochemical criteria for polypeptide and protein chain conformations, 909
Permeability, ionic, of muscle cells and models, 777
——, semipermeable membranes, electrical conductance of, formal analysis, 867
——, semipermeable membranes, electrical conductance of, unipolar flow, symmetric electrolytes, 887
Phenylalanine powder, UV spectral properties of, 867
Photoreactivation, evidence for two mechanisms of, in *Escherichia coli* B, 75
Physical state of viral nucleic acid and sensitivity of viruses to ultraviolet light, 257
Planck-Nernst equations, time-dependent, numerical solution of, 145
Polarized ultraviolet light, inactivation of oriented bacteria with, 473
Poly-γ-benzyl-L-glutamate, studies on, effects of solvent environment on optical rotatory dispersion parameters of polypeptides. 553
——, theory of birefringence, 531
Poly-L-glutamic acid, studies on, effects of solvent environment on optical rotatory dispersion parameters of polypeptides, 573
Polypeptide, helical, poly-γ-benzyl-L-glutamate, intrinsic birefringence, and birefringence theory, 531
—— and protein chain conformations, stereochemical criteria for, allowed conformations for pair of peptide units, 909
Polypeptides, effects of solvent environment on the optical rotatory dispersion parameters of, studies of poly-γ-benzyl-L-glutamate, 553
——, effects of solvent environment on the optical rotatory dispersion parameters of, studies of poly-L-glutamic acid, 573
Potassium conductance in squid giant axon, new interpretation of dynamic changes of, 163
Potential formulation, for active cell, extension of, solid angle, 663
——, non-steady-state membrane, of ion exchangers with fixed sites, 247
Powder, phenylalanine, UV spectral properties of, 687
Probabilistic characterization of simultaneous nerve impulse sequences controlling dipteran flight, 447
Protein and polypeptide chain conformations, stereochemical criteria for, allowed conformations for pair of peptide units, 909
—— structure, influence of amino acid sequence on, 809
Puck and Steffen's equations for life cycle analysis of mammalian cells, 743
Punch-through, quantitative analysis of voltage-current relationships of fixed charge membranes and associated property of, 669

Q

Quantasomes, spinach, molecular orientation in, flow dichroism apparatus and application to study of structure, 337

R

Random learning networks, limitations on complexity of, 195
—— and rhythmic stimulation of locust thoracic ganglia, motor output patterns during, 121
Rats, blood calcium level, symbolic model for regulation by bone metabolism of, 349
Red light, tropic responses of *Funaria* spores to, 715
Relaxation, dielectric, of molecules with fluctuating dipole moment, 617
Replication, bacterial chromosome, in amino acid–deficient *Escherichia coli* 15T⁻, autoradiographic studies of, 629
Respiratory control system, human, mathematical model of, 27
—— response to cerebrospinal fluid P_{CO_2} in cat, digital computer simulation of, 935
Response, transient, thermoelectric method, local blood flow in human leg muscle measured by, 211, 616
Rheotropism, cellular, quantitative study of, 317
Rhythmic and random stimulation of locust thoracic ganglia, motor output patterns during, 121
Ribonucleic acid, deoxy-, multiple-coiled, intrinsic birefringence of, theory and applications, 275
—— acid, deoxy-, and RNA hybrids, annealed and enzymatically synthesized, chromatographic separation of, 231
—— acid and DNA hybrids, annealed and enzymatically synthesized, chromatographic separation of, 231
Roentgen ray diffraction of crystalline structure of avian egg shell, 359
—— ray and ultraviolet sensitivity of synchronized Chinese hamster cells at various stages of cell cycle, 1
Rotatory dispersion parameters, optical, of polypeptides, effects of solvent environment on, studies on poly-γ-benzyl-L-glutamate, 553
—— dispersion parameters, optical, of polypeptides, effects of solvent environment on, studies on poly-L-glutamic acid, 573

S

Selective biological transport, kinetics of, determination of transport constants for sugar movements in human erythrocytes, 407
Sensitivity of viruses to ultraviolet light, and physical state of viral nucleic acid, 257
——, x-ray and ultraviolet, of synchronized Chinese hamster cells at various stages of cell cycle, 1
Separation, chromatographic, of annealed and enzymatically synthesized RNA-DNA hybrids, 231
Shell, avian egg, x-ray diffraction of crystalline structure of, 359
Skin, frog, AC impedance of, and relation to active transport, 591
——, frog, water flow across, 987
Sodium deoxyribonucleate, aqueous, structural transition produced by electric fields in, 607
Solid angle potential formulation for active cell, extension of, 663
Solution, numerical, of time-dependent Nernst-Planck equations, 145
Solvent environment, effects of, on optical rotatory dispersion parameters of polypeptides, studies on poly-γ-benzyl-L-glutamate, 553
—— environment, effects of, on optical rotatory dispersion parameters of polypeptides, studies on poly-L-glutamic acid, 573
Spectral, UV, properties of phenylalanine powder, 687
Spermatozoa, bull, tail movement of, observations and model calculations, 365
Spherical source washed by slow flow, concentration gradient across, 201
Spike discharge patterns of spontaneous and continuously stimulated activity in cochlear nucleus of anesthetized cats, 301
Spinach quantasomes, structure, flow dichroism apparatus and application to study, 337
Spores, *Funaria*, tropic responses to red light, 715
Squid giant axon, new interpretation of dynamic changes of the potassium conductance in, 163
Statistical analysis of continual activity of single cortical neurons in cat unanesthetized isolated forebrain, 47
Steady-state, non-, membrane potential of ion exchangers with fixed sites, 247
——, properties of ion exchange membranes with fixed sites, 511
Steffen and Puck's equations for life cycle analysis of mammalian cells, 743
Stereochemical criteria for polypeptide and protein chain conformations, allowed conformations of pair of peptide units, 909
Steroid structural data, preparation of, for consideration of structural-functional relationships, 425
Stimulated activity, spontaneous and continuously, in cochlear nucleus of anesthetized cats, spike discharge patterns of, 301
Stimulation, random and rhythmic, of locust thoracic ganglia, motor output patterns during, 121
Structural-functional relationships, preparation of steroid structural data for consideration of, 425

Sugar movements in human erythrocytes, determination of transport constants for, kinetics of selective biological transport, 407
Sugars in human erythrocytes, equations for induced uphill transport of, kinetics of selective biological transport, 417
Suspension, electrical counting and sizing of mammalian cells in, 393
Symmetric electrolytes, unipolar flow, electrical conductance of semipermeable membranes, 887
Synthesized, enzymatically, and annealed RNA-DNA hybrids, chromatographic separation of, 231

T

Tail movement of bull spermatozoa, observations and model calculations, 365
Temperature change, zone centrifugation in cesium chloride density gradient caused by, 947
Terrestrial evolution, thermodynamics, 965
Thermal migration in biological transport, 651
Thermodynamics of human brain, 981
—— of terrestrial evolution, 965
Thermoelectric method, transient response, local blood flow in human leg muscle measured by, 211, 616
Thoracic ganglia, locust, motor output patterns during random and rhythmic stimulation of, 121
Time-dependent Nernst-Planck equations, numerical solution of, 145
Tracer data, biological, investigation of operator method in analysis of, 89
Transport, active, AC impedance of frog skin and relation to, 591
——, biological, thermal migration in, 651
——, carrier-mediated, unified kinetic hypothesis, applications, 487
——, selective biological, kinetics of, determination of transport constants for sugar movements in human erythrocytes, 407
——, selective biological, kinetics of, equations for induced uphill transport of sugars in human erythrocytes, 417
Trimethyl, cetyl, ammonium bromide and $HgCl_2$, dielectric behavior of yeast cells treated with, 439
Tropic responses of *Funaria* spores to red light, 715
Tropism, rheo-, cellular, quantitative study of, 317

U

Ultraviolet light, polarized, inactivation of oriented bacteria with, 473
—— light, sensitivity of viruses to, and physical state of viral nucleic acid, 257
—— spectral properties of phenylalanine powder, 687
—— and x-ray sensitivity of synchronized Chinese hamster cells at various stages of cell cycle, 1
Unipolar flow, symmetric electrolytes, electrical conductance of semipermeable membranes, 887

V

Viral nucleic acid, physical state of, and sensitivity of viruses to ultraviolet light, 257
Viruses, sensitivity of, to ultraviolet light, and physical state of viral nucleic acid, 257
Voltage-current relationships of fixed charge membranes and associated property of punch-through, quantitative analysis of, 669

W

Water flow across frog skin, 987

X

X-Ray. *See* Roentgen ray.

Y

Yeast cells, dielectric behavior of, treated with $HgCl_2$ and cetyl trimethyl ammonium bromide, 439

Z

Zone centrifugation in cesium chloride density gradient caused by temperature change, 947